DISINFECTION.

A CIRCULAR FROM THE STATE BOARD OF HEALTH.

Recent experiments made under the direction of the International Cholera Commission have shown that the ordinary methods of disinfection are inefficient, and, in practice, they have often failed to arrest the spread of infectious diseases.

As it is impossible to experiment directly upon the *unknown* low organisms, which are thought to be the means of transporting the various infectious diseases, the effects of chlorine and sulphurous acid were studied upon *known* living organisms; the probabilities being thought to be in favor of the theory that complete disinfection should destroy at least all known forms of life, although it may be true that the tenacity of life of the infective matter of various diseases differs, just as the degree of cold necessary to put a stop to yellow fever is much less than that required to arrest the spread of cholera.

Chlorine and sulphur fumes, in sufficient quantity, were found to be efficient in killing insects, fungi, bacteria and infusoria; the objections to chlorine in houses being that it is more costly; that its use is more difficult, and that it destroys metals, textile fabrics and colors.

The burning of ten grams of sulphur for each cubic meter of air-space, tightly closed, was found *not* to kill bacteria, infusoria, or all insects; twenty grams, however, were proved to be sufficient for that purpose. One volume of water, when saturated at 59° F., absorbs thirty-seven volumes of sulphurous acid,— enough to kill all the low organisms found in putrid urine.

The following articles were found uninjured after several hours' exposure to an atmosphere in which twenty grams of sulphur had been burned to every cubic meter of air-space: a clock of steel and brass; rusty and clean nails; gold and silver money; a military epaulet; various colored silk articles; a colored rug; calico; down-pillows; a gilt-framed looking-glass; books; water in an uncorked bottle; flour; meat; salt; bread; apples; cinnamon; vanilla; cigars; wall-paper; oil paintings; varnished articles; gas-fixtures; water-fixtures; a highly polished razor had a slightly cloudy appearance on its upper side, but that was easily rubbed off. The flour and meat were cooked and eaten, and the cigars were smoked, without any abnormal taste or smell being observed; in the bread not all of the observers noticed a slightly acid taste; the inside portion of the apples was unchanged, the skin was slightly sour; the water, after standing, had an acid reaction, but no decided taste or smell. Litmus paper placed between the leaves of books and under the carpet was turned bright red. Many of the articles exposed had a decided smell of sulphur at first, but that soon disappeared.

The experiments seemed to show that clothing, bedding and other articles may be disinfected without being changed chemically or injured; and it should be added that practically this method has apparently accomplished perfect disinfection, as tested in Berlin.

If we may judge from these results, effective disinfection, by burning sulphur, requires eighteen ounces to each space of one thousand cubic feet. The sulphur should be broken in small pieces, burned over a vessel of water or sand, so as to avoid danger from fire, and, if the room is large, it should be put in separate vessels in different places. The room should be tightly closed for six hours and then aired; it is better that the room should be warm than cold. Of course, efficiently disinfected air is, during the process of disinfection, irrespirable. Most articles may be disinfected in this way, if hung up loosely in the fumigated chamber, although it would be an additional safeguard to expose any thing thick, like a bed-mattress, to prolonged heat at a temperature of about 240° F.; and, indeed, heat must, with our present knowledge, be considered the best disinfectant. With this end in view, local boards of health are advised to procure furnaces and laundries, as is commonly done in other countries, to be used for the sole purpose of disinfecting articles which have been exposed to the infectious diseases, as recommended in the Ninth Annual Report of the State Board of Health, and described by Dr. A. H. JOHNSON, in an exhaustive paper on Scarlet Fever (pp. 255 *et seq.*), in that report. Of course, a much simpler disinfecting furnace than that described will answer every purpose. For ordinary use, in disinfecting *houses*, the sulphur process is the best.

A solution of chloride of zinc (one part of Burnett's Disinfecting Fluid to two hundred of water), very quickly kills bacteria *which have been placed in it*, and arrests putrefaction. Caustic lime serves equally as well (1 to 100), but leaves a sediment not always easy to remove. Carbolic acid in sufficient strength to be effective (1 to 100) is more expensive and of disagreeable odor.

It is needless to add that "disinfectants" used in sufficient quantities to destroy bad smells do not necessarily kill microscopic living organisms; and it is not supposed that they directly influence the so-called "germs" of the infectious diseases, unless concentrated to the extent which has been mentioned.

Finally, fresh, pure air acts as one of the best "disinfectants" by enormously diluting the infectious matter, and, under certain conditions, including time, must render it inert to all effect even if not quickly destroying it, as many think is the case.

STATE HOUSE, BOSTON, April, 1879.